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EPAct/EISA Test Programs in ASD
23rd Bi-Weekly Report
March 12, 2009

1. Light Duty Gas Exhaust Fuels

Contractor: SwRI, EP-C-07-028, WA 0-1, WAs 1-1, 1-2, 1-3, 1-4
WAM: Connie Hart
Alt. WAM: Rafal Sobotowski
Other team members: Mike Christianson, Tony Fernandez, Carl Fulper, Aron Butler
Budget: \$4.3M, plus \$3M in collaboration with NREL Now \$5M, plus NREL

Objective: Phases 1 and 2 are in support RFS 2 NPRM and Phase 3 is to establish the effects of RVP, T50, T90, aromatic and EtOH content on exhaust emissions from Tier 2 vehicles

Time Line

- Testing began by second week of April 2008
- Phase 1 and half of Phase 2 finished by the end of June: Fuels 17 and 18 of Phase 1 were complete by end of June. Fuel 19 by end of July due to fuel delivery delays. Phase 2 started by mid-November 2008. to finish mid February 2009.
- Phase 3 will be finished May 2009: Phase 3 to be complete by January 2010 between testing/fuel delays to date and additional CRC fuels added into our random matrix.

Program Status:

- Phase 3 testing started today.
 - Speciation shall be included for 8 out of 16 of our fuels (12 overall) without replicate testing, after coordination with and extra funding from DOE
 - Calculation of NMOG has been finalized
- Fuel status for Phase 3:
 - All eight E0 fuels have been delivered to SwRI
 - Halterman has reblended Fuel #5 – samples are at SwRI for confirmatory testing before shipping.
 - E10 fuels:
 - 3 have been delivered to SwRI
 - 3 have been bulk blended, awaiting confirmatory tests before shipping
 - 1 in bulk blending phase
 - 1 more is close to approval for bulk blending.
 - E20 fuels:
 - 2 have been delivered to SwRI
 - 3 has been bulk blended, awaiting confirmatory tests before shipping.
 - 2 are in bulk blending stage.
 - E15 fuels:
 - 1 is in the bulk blending phase
 - 2 are in the hand blend stage
- Phase 2 cold room testing complete

- Briefing on preliminary results scheduled for Chet 3/19/09.
- Data/Analysis:
 - Data for Phase 2: continuing analysis, working on quality checks.

1.a. Supplemental Testing

Contractor: SwRI, EP-C-07-028, and NVFEL
 Lead: Tony Fernandez
 WAM: Connie Hart
 Alternate WAM: Mike Christianson
 Other team members: Aron Butler
 Budget: \$350K

Objective: Gather additional information during vehicle down-time to answer questions arising from test results to date.

Time Line

- Testing to occur at SwRI before and after Phase 2, while waiting for cold room to be fully functional.

Program Status:

- Testing of the 6 (of 19) vehicles on fuels 17, 18 and 19 has been completed.
 - Data has been QA/QC'd and analyzed.
- 2 Tier 1 CRC vehicles which were shipped from Phoenix have been prepared for testing. They will be tested after or during Phase 3 if funding is available.

2. Oil Study

Contractor: NVFEL
 Project lead: Mike Christianson, Rafal Sobotowski
 Budget:

Objectives: Results to impact Phase 3 of EPAct study at SwRI (July)

Objective 1: Define duration of engine oil conditioning needed to stabilize the effect of oil volatility on PM emissions

Objective 2: Define the impact of lubricant interaction with fuel ethanol on PM emissions

Time Line

- Estimated duration of pilot: 15 weeks (May 11)

Program Status:

- Presenting results at CRC Workshop end of March.

- Statistically significant changes in PM observed: PM mass decreased rapidly from 0 to 500 miles in both vehicles. Trend continues to 2000 miles occurs but change is small.
 - PM variability increases at full useful life (5000 mi)
 - Trends for gaseous pollutants vary by vehicle, but are mainly insignificant
 - Ethanol results are inconclusive
 - Qualitative reduction in PM observed with ethanol
 - Gaseous pollutants not statistically significant except NMHC and FE reductions as expected
 - Oil drain analysis indicates no significant deterioration of lubricant quality with E10 and E20

3. PM Speciation

Contractor: NVFEL

Project lead: Mike Christianson, Marion Hoyer

Other team members: Rafal Sobotowski, Joe McDonald

Budget: \$345K (\$55K on inventory and data issues from other EPAAct programs)

Objective: To determine fuel effects on PM mass, size and composition, and obtain speciated semi-volatile VOC, metals and ions, and gaseous VOC (MSATs), alcohols and carbonyls.

Time Line: Late 2008 (to take place in 2009)

Program Status:

- LOD and NRML site modifications ongoing (LOD will be done first).
- Testing will likely begin in May in LOD prior to a round robin/correlation program at NRMRL.
- Still on track to complete all testing this year.
- Toxics sampler prototype assembled; system checks have begun, available in mid-April for program

4. Nonroad Exhaust Program

Contractor: Carnot Intertek

WAM: Cheryl Caffrey

Alt. WAM:

Budget: \$830K

Project Overview:

Objective: Testing 6 paired engines including 2 Class 1, 2 Class 2, 2 Class 4, (one Class 2 engine has catalyst) on three fuels; national average non-oxy gasoline (Fuel A), an octane matched E10 (Fuel B), and a certification fuel (E0).

Timeline

- The original program was to be completed last year
- Should begin by April 1st and finish in October of this year: delays in schedule due to fuel delivery status.

Program Status

- Work will be complete by the end of March.
 - Individual engine reports are being written and reviewed
 - Last handheld engine is being aged and emission tested.

4.a. Nonroad Exhaust tie-in with CARB

Contractor: SwRI
WAM: Cheryl Caffrey
Alt. WAM:
Other team members: Tony Fernandez
Budget: \$500K

Program Status

- Small engine testing is ongoing in coordination with ARB and results are coming in.
- Equipment is being acquired
 - ARB marine engines
 - Two nonroad 2 stroke motorcycles
- Fuel has been ordered.
- On schedule for June completion

5. Evap Testing

Contractor: SwRI, EP-C-07-028, WA 1-5
WAM: Connie Hart
Alt. WAM: Dave Brzezinski
Other team members: Tony Fernandez
Budget: \$600K

Objective: Additional, newer technology, high sales volume vehicles to the CRC E-77-2 permeation test program.

Time Line: Testing from June 2008 thru June 2009: Testing started in fall.

Program Status:

- E10, 10 psi tests coming to completion.
- Two vehicles are in 4 week prep for E0 testing.

- Preliminary results along with E-77-2 results will be presented at the CRC Workshop at the end of the month.

6. Determine Percent of High Evaporative Vehicles in Fleet

Contractor: ERG, EP-C-06-080, WA 1-2, 2-2
 WAM: Connie Hart
 Alt. WAM: Dave Brzezinski
 Other team members: Carl Fulper, Tony Fernandez, Jim Warila
 Budget: \$1M

Objective: Find the percentage of high emitting evaporative emission vehicles in the average fleet of on-road motor vehicle passenger cars and light trucks.

Time Line

- ICR clock started with Federal Register notice 2/14/08
- SOW package went to Cincinnati 2/22/08
- Approval of Work Plan by March 24: Work Plan was approved June 19 (after CRADA signed).
- Contractor to supply supporting documents for ICR submission March 31: delivered May 8th.
- Another 30 day comment period for ICR, roughly month of May.
- Goal is to have ICR in place by mid-June for recruitment and pilot field work to begin. Partial ICR approval was given for the Pilot phase.
- Finalize test procedure for larger program by August 22 so recruitment can begin for field work in Sept and October. Larger program to be defined by end of September for small version of larger program - San Antonio Pilot.
- Compile data and draft report by early December of 2008. Larger program is planned for spring of 2009, report end of summer 2009.

Program Status:

- Will be presenting project at CRC Workshop end of March
- ERG continuing to QA/QCing and analyze the data.
- Proceeding with ICR for larger program.
- Looking for funds for larger program.
 - Requesting \$500K in FEEs \$\$
 - CRC is interested in program, will consider in next years budget.